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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,839	03/30/2001	Prashant B. Phatak	CY-0019	6118

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EXAMINER
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GUERRERO, MARIA F

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 10/07/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/823,839

Applicant(s)

PHATAK ET AL.

Examiner

Maria Guerrero

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 20-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16, 18 and 19 is/are rejected.
- 7) ☒ Claim(s) 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### **DETAILED ACTION**

1. This Office Action is in response to the Election filed July 8, 2002.

Claims 1-22 are pending.

#### ***Election/Restrictions***

2. Applicant's election with traverse of Group I (claims 1-19) in Paper No. 4 is acknowledged. The traversal is on the ground(s) that the process relied upon in the rejection is not materially different than Applicants' claimed processes. This is not found persuasive because the example stated in the restriction requirement is simply that, an example. There are other materially different processes that could be used to form the claimed product; the doped insulating film could be formed by other methods including laminating and screen-printing. Also, the requirement for searching of the process claim does not necessitate a search in the product art, process and product art have gain separate stature in the office.

The requirement is still deemed proper and is therefore made FINAL.

3. Claims 20-22 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 4.

***Oath/Declaration***

4. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:  
It does not identify the citizenship of each inventor.

It does not identify the city and either state or foreign country of residence of each inventor. The residence information may be provided on either on an application data sheet or supplemental oath or declaration.

***Drawings***

5. Figures 2-4 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Specification***

6. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the specification fails to provide proper antecedent basis for the supply ratio varies from about 30% to 45%. The specification provides antecedent basis for the supply ratio varies from about 30% to 40.5% (Figure 6).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Orczyk et al. (U.S. 5,937,323).

Orczyk et al. teaches varying a dopant supply rate for a doped insulating layer according to a variation in temperature of a substrate on which the doped insulating layer is being formed (col. 15, lines 22-25, col. 17, lines 35-43). Orczyk et al. shows the doped insulating layer being formed by a high-density plasma deposition process (col. 12, lines 45-50).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-3, 5-7, 9-11, 13-16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (U.S. 6,100,202) in view of Ilg et al. (U.S. 5,807,792).

Lin et al. teaches varying a dopant supply rate for a doped insulating layer, providing different dopant supply rate for different time periods, the doped insulating layer comprising phosphosilicate glass (col. 5, lines 60-65, col 15, lines 1-40). Lin et al.

teaches increasing the dopant supply rate, etching a contact hole through the doped insulating layer, varying the dopant supply rate for an initial thickness of the insulating film, maintaining a constant dopant supply rate for a second period of time (Fig. 3-6, col. 5, lines 60-67, col. 9, lines 5-10, 25-40, col. 10, lines 25-45). Furthermore, Lin et al. shows a forming a pre-metal dielectric layer having a thickness of from 500 to about 100 angstroms, the second deposition step forming a layer of thickness about 9000 angstroms, the total thickness of the doped silicate glass layer being from about 10000 to about 11000 angstroms (col. 7, lines 60-62, col. 10, lines 15-17, col. 15, lines 25-30).

Lin et al. does not specifically show varying the dopant supply rate according to a variation in temperature, compensating for a temperature dopant gradient. However, Lin et al. shows the substrate temperature being from about 380 to 420 degrees C (col. 9, lines 64-67). In addition, Ilg et al. teaches concentration of dopant and reaction temperature are related to non-uniformity of dopant concentration. Ilg et al. show that the increased in the temperature produced a more uniform distribution of dopant (col. 8, lines 5-10).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to recognize that the variation of the dopant supply rate on Lin et al. disclosure is according to a variation in temperature as suggested Ilg et al. The modification would provide a doped silicate glass material having uniform distribution of dopant (Ilg et al., col. 8, lines 8-10).

Art Unit: 2822

9. Claims 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (U.S. 6,100,202) and of Ilg et al. (U.S. 5,807,792) as applied to claims 1-3, 5-7, 9-11, 13-16, and 18 above, and further in view of Wang et al. (U.S. 4,376,672).

Regarding claims 8 and 12, the combination of Lin et al. and Ilg et al. does not specifically show the phosphorous concentration being greater than about 7% by weight. However, Wang et al. shows that phosphosilicate glass having a phosphorous concentration greater than 7% by weight is well known in the art. Wang et al. also shows typical etch results for phosphosilicate glass (col. 12, lines 5-20).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to specify the concentration of phosphorous on the process described by the combination of Lin et al. and Ilg et al. as taught Wang et al. in order to better control the etching rate.

10. Claims 11 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orczyk et al. (U.S. 5,937,323).

Orczyk et al. teaches varying a dopant supply rate for a doped insulating layer according to a variation in temperature of a substrate on which the doped insulating layer is being formed (col. 15, lines 22-25, col. 17, lines 34-43). Orczyk et al. shows using a feed back-based temperature control system and a process gas control system that adjust the flow rates of the gas as necessary and have open/close position valves (col. 8, lines 19-20, 45-50, col. 9, lines 65-67, col. 10, lines 1-10, 25-45, col. 14, lines 15-20).

Regarding claims 11 and 19, Orczyk et al. does not specifically show compensating for a temperature dependent dopant gradient. However, Orczyk et al. teaches that the temperature of the substrate of the substrate is important because it affect how well the dopant is incorporated. Orczyk et al. also teaches varying the temperature of the wafer in order to increase the rate of deposition (col. 13, lines 25-28, col. 15, lines 23-26).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to recognize that the variation of dopant in the process taught by Orczyk et al. is compensating the dopant gradient in order to increase the rate of deposition.

#### ***Allowable Subject Matter***

11. Claim 17 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. And by providing proper antecedent basis for the supply ratio varies from about 30% to 45% in the Specification. The claims as filed in the original specification are part of the disclosure and therefore, if an application as originally filed contains a claim disclosing material not disclosed in the remainder of the specification, the applicant may amend the specification to include the claimed subject matter. In re Benno, 768 F.2d 1340, 226 USPQ 683 (Fed. Cir. 1985).

The following is a statement of reasons for the indication of allowable subject matter: there is evidence indicating that the supply ratio varies from about 30% to 40.5 % is critical (Fig. 6, page 10).



Art Unit: 2822


***C nclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Vassiliev et al. (U.S. 6,355,581) shows a method for fabricating silicon glass layers using High Density Plasma CVD. Monkowski et al. (U.S. 5,104,482) teaches a glass deposition process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 703-305-0162.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on 703-308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

  
Maria Guerrero  
Patent Examiner  
October 1, 2002